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PATENT  
ATTY. DOCKET NO.: P67552US0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

WOLFGANG BILLINGER, et al.

Group Art Unit: 3644

Serial No. 10/053,666

Examiner: S. Holzen

Filed: January 24, 2002

For: DEVICE FOR CONNECTING MOVABLE PARTS WITH STRUCTURAL  
ELEMENTS OF AIRPLANES AND THE LIKE

**DECLARATION OF WOLFGANG BILLINGER**

Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Wolfgang Billinger, do hereby declare the following:

1. I reside in Ried, Austria, am currently employed by Fischer Advanced Composite Components AG (FACC AG) at Fischerstr:9, P.O. Box 192, A-4910 Ried, Austria, and am one of the named inventors for the above-identified application.

2. My educational background is set forth on my Curriculum Vitae ("CV") attached hereto as Attachment A. As indicated, I have a Master's degree in engineering from the technical university of Vienna. I have also been published extensively in the field of composite materials.

3. My professional experience, which is also set forth on the attached CV, Attachment A, includes over 14 years of experience as a senior engineer with FACC AG, at least six of which have been spent

in the development and testing of connecting devices for the securing of structural components and movable parts of aircraft. Throughout my tenure with FACC AG, I have gained extensive experience in calculating monolithic and sandwich structures of state of the art composite materials, as well as metallic airplane structures. As a result of my education and experience, my professional contemporaries and colleagues consider me an expert in composite structures and materials, specifically as such composite technology relates to the aviation field.

4. Based upon my education and experience, I have an opinion regarding what the level of ordinary skill in the aviation field as related to composite technology generally would be. In most cases, such persons would have at least a bachelor's degree in mechanical engineering, and would have at least several years of experience in mechanical engineering.

5. Drawing upon my expertise in this industry, I understand the level of ordinary skill in the art at the time the above-captioned application was filed (January 24, 2002) and can offer my expert opinion as to how persons of ordinary skill in the art would perceive and respond to relevant art in the field of composite technology, particularly as it pertains to the aviation field.

6. In the aviation field, a fitting suitable for high load application, such as that acting on the movable parts used to assist the aircraft in taking off, landing, and moving, must be especially stable and not prone to separation from the movable part due to

shearing forces. Such shearing forces are caused by the high temperature deviations faced in aviation and the differences in temperature coefficients between synthetic components and metal fittings. However, as representatively shown by U.S. patents to Roeseler et al. (4,213,587) and Arena (5,098,043) as discussed in the specification, persons of ordinary skill in the art attempting to solve these problems did not contemplate a fitting made of synthetic composite material according to a resin transfer molding method, and including a carbon fabric as a reinforcing element, nor did they contemplate a securing of the fitting to the movable part by gluing. Instead, what was known by persons of ordinary skill was reliance upon metal fasteners, often a high number of screws or rivets, for secure connection of metal fittings to movable parts.

7. I have reviewed the prior art considered by the Patent Examiner, specifically U.S. Patent No. 4,966,802 to Hertzberg and EP 0 532 016 to Padden.

8. Padden describes a spoiler for an aircraft wing which is disclosed as being made of a composite material. However, there is nothing to suggest the use of a synthetic material for the fitting (which instead is made of aluminum), nor is there anything to suggest the formation of the fitting from the same composite material as the movable part so that both parts share a common thermal expansion coefficient; again, a fitting made of synthetic composite material according to a resin transfer molding method, whether joined to the movable part by gluing or formed integrally

therewith, was considered by persons of ordinary skill in the field to be structurally inadequate for the high-load application being claimed by my invention.

9. Hertzberg describes composites made of fiber reinforced resin elements joined by adhesive *for joining sheets or panels of material and their reinforcing members*. These sheets or panels, when adhered together, are resistant to the delamination problems associated with prior resin composites and therefore represent an improvement over prior resin composites. However, Hertzberg does not contemplate the use of fiber reinforced resin elements in the formation of *fittings* to secure movable and structural parts.

10. Persons skilled in the aviation field seeking to design a fitting for high load application between movable and structural parts of an aircraft would look to the art of metal fittings. Such persons would not look to laminated panel construction such as shown in the U.S. patent of Hertzberg (4,966,802), in seeking to design a fitting for the purpose and application claimed in the subject patent application.

11. During my six years of developing and testing connecting devices for the securing of structural components and movable parts of aircraft, I have never seen a fitting made of synthetic composite material according to a resin transfer molding method, and including a carbon fabric as a reinforcing element, with the fitting being secured to the movable aircraft part by gluing. Nor am I aware of anyone in the aviation industry who considered the use of a fitting

of such construction for this application.

12. When a fitting of the claimed type was introduced to the industry in 2002, the response of experts was high interest with some disbelief. Such a fitting was universally considered to be inadequate to withstand the known shearing stresses, as was the use of glue to connect movable and structural aircraft components. Further, in this technology field, namely high-load aircraft applications, bolting and gluing are not considered equivalent by persons of ordinary skill therein.

13. It is my opinion that the subject matter claimed in the above-identified application would not have been obvious to one of ordinary skill in the art based upon the prior art cited and considered by the Patent Examiner, or any other prior art fitting construction and design known to me.

14. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under section 1001 of Title 18 of the United States Code; and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

7.6.2004

Date

Dipl.-Ing. W. Billinger

Wolfgang Billinger

Attachment A: CV of Wolfgang Billinger



## **RESUME**

**STATUS: May, 2004**

**NAME:**

**Dipl. Ing. WOLFGANG BILLINGER**

**COMPANY ADDRESS:**

**FISCHER ADVANCED COMPOSITE COMPONENTS AG  
FISCHERSTR: 9/P.O. BOX 192  
A-4910 RIED/AUSTRIA**

**COMPANY PHONE NUMBER:**

**0043 7752 616 201**

**COMPANY FAX NUMBER:**

**0043 7752 616 8201**

**HOME ADDRESS:**

**PETERSKIRCHEN 17  
A-4743 PETERSKIRCHEN / AUSTRIA**

**DATE OF BIRTH:**

**FEBRUARY 02, 1962**

**NATIONALITY:**

**AUSTRIA**

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### **A) EDUCATION:**

**1968 – 1972**

**primary school**

**1972 – 1980**

**secondary school**

**1980**

**school leaving examination of secondary school**

**October 1980 - September 1981**

**military service in the Austrian army**

**1981 - 1986**

**technical university of Vienna, study for mechanical engineering;  
special lectures of light weight structures and finite elements  
dissertation at the institute for lightweight structures and aircraft construction**

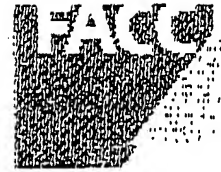
**December 1986**

**graduate engineer, released by the technical university of Vienna**

### **B) WORK EXPERIENCE**

**1987 - 1990**

**Project engineer at Wintersteiger GmbH ( Ried ) for woodworking machines (division engineering ). Stress Engineer for division sports and division seedmech of Wintersteiger.**



Since 1990  
Stress Engineer at **Fischer Advanced Composite Components ( FACC ) GmbH.**  
for FRP - Components for the US and European Aircraft Industry.

Since 2000  
R&D Manager FACC AG

### **C) SPECIAL EXPERIENCE**

#### **Composite Technology**

Experience in calculating monolithic structures ( MD11 - flap hinge fairings, MD90 - strake, ... ) as well as sandwich structures ( A320 - hatrack, MD11 - flap hinge fairings, B717 - ceiling panel, sidewall panel, bagrack, A340 - thrust reverser blocker door, ... ) , consisting of all state of the art composite materials with duroplastic resin systems.

Experience in calculating metallic airplane structures ( A320 - main landing gear door hinge, B717 - bearings and brackets, B717 - z-bridge and intercostals, A340 - trust reverser blocker door fittings, .. ) A340 - Spoiler, A340 - blocker door, RTM - Center Fitting

New production methods ( liquid mouldings ) and simulation of them. M&PE activities like qualification of new materials.

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Signature:

*Diad. Ing. W. Billinger*

Wolfgang Billinger  
Mai 2004